ABSTRACT

A nanocomposite magnet according to the present invention has a composition represented by the general formula: $R_xQ_yM_z(Fe_{1-m}T_m)_{bal}$, where R is at least one rare-earth element, Q is at least one element selected from the group consisting of B and C, M is at least one metal element that is selected from the group consisting of Al, Si, Ti, V, Cr, Mn, Cu, Zn, Ga, Zr, Nb, Mo, Ag, Hf, Ta, W, Pt, Au and Pb and that always includes Ti, and T is at least one element selected from the group consisting of Co and Ni. The mole fractions x, y, z and m satisfy the inequalities of 6 at%$\leqq$x$<$10 at%, 10 at%$\leqq$y$\leqq$17 at%, 0.5 at%$\leqq$z$\leqq$6 at% and $0\leqq m\leqq 0.5$, respectively. The nanocomposite magnet includes a hard magnetic phase and a soft magnetic phase that are magnetically coupled together. The hard magnetic phase is made of an $R_2Fe_{14}B$-type compound, and the soft magnetic phase includes an α-Fe phase and a crystalline phase with a Curie temperature of 610 ℃ to 700 ℃ (ω phase) as its main phases.